

IN THE CLAIMS

The status of each claim in the present application is listed below.

1. (Currently Amended): An organosilane-based composition for producing a barrier layer for gases, comprising at least one of composition (A), composition (B) and composition (C), wherein:

composition (A) comprises:

(i) at least one organoalkoxysilane having comprising at least one unsaturated hydrocarbon group;

(ii) at least one aminoalkylalkoxysilane;

(iii) at least one polyol;

(iv) optionally a further alkoxysilane or alkoxysiloxane;

(v) optionally at least one nano- or microscale semimetal oxide or metal oxide, semimetal oxide hydroxide or metal oxide hydroxide, or semimetal hydroxide or metal hydroxide; and

(vi) an organic solvent;

composition (B) comprises at least one cocondensate of the at least one organoalkoxysilane, the at least one aminoalkylalkoxysilane, the at least one polyol, optionally the further alkoxysilane or alkoxysiloxane and optionally the at least one nano- or microscale semimetal oxide or metal oxide, semimetal oxide hydroxide or metal oxide hydroxide, or semimetal hydroxide or metal hydroxide, and the organic solvent;

composition (C) comprises a reaction product produced under hydrolysis conditions of the at least one organoalkoxysilane, the at least one aminoalkylalkoxysilane, the at least one polyol, optionally the further alkoxysilane or alkoxysiloxane and optionally the at least

one nano- or microscale semimetal oxide or metal oxide, semimetal oxide hydroxide or metal oxide hydroxide, or semimetal hydroxide or metal hydroxide, and the organic solvent;

the components of composition (A) and/or the precursors of composition (B) and composition (C) are present such that a molar ratio of the at least one organoalkoxysilane: the at least one aminoalkylalkoxysilane: the at least one polyol is 1 : 0.5 to 1.5 : 0.3 to 1.1;

the at least one organoalkoxysilane is at least one member selected from the group consisting of: vinyltrimethoxysilane, vinyltriethoxysilane, 3-methacryloxypropyltrimethoxysilane, 3-methacryloxypropyltriethoxysilane, 3-methacryloxypropylmethyldimethoxysilane, vinylmethyldimethoxysilane, vinylmethyldiethoxysilane, 3-methacryloxypropylmethyldiethoxysilane, 3-acryloxypropyltrimethoxysilane, 3-acryloxypropyltriethoxysilane, 3-acryloxypropylmethyldimethoxysilane, and 3-acryloxypropylmethyldiethoxysilane;

the at least one aminoalkylalkoxysilane is at least one member selected from the group consisting of 3-aminopropyltrimethoxysilane, 3-aminopropyltriethoxysilane, N-phenyl-3-aminopropyltrimethoxysilane, N-phenyl-3-aminopropyltriethoxysilane, N-butyl-3-aminopropyltrimethoxysilane, N-butyl-3-aminopropyltriethoxysilane, N-methyl-3-aminopropyltrimethoxysilane, N-methyl-3-aminopropyltriethoxysilane, N-(2-aminoethyl)-3-aminopropyltrimethoxysilane, N-(2-aminoethyl)-3-aminopropyltriethoxysilane, N,N-di(2-aminoethyl)-3-aminopropyltrimethoxysilane, N-[N'-(2-aminoethyl)-2-aminoethyl]-3-aminopropyltrimethoxysilane, N,N-di(2-aminoethyl)-3-aminopropyltriethoxysilane, N-[N'-(2-aminoethyl)-2-aminoethyl]-3-aminopropyltriethoxysilane, 3-aminopropylmethyldimethoxysilane, 3-aminopropylmethyldiethoxysilane, N-butyl-3-aminopropylmethyl-dimethoxysilane, N-butyl-3-aminopropylmethyldiethoxysilane, N-(2-aminoethyl)-3-aminopropylmethyldimethoxysilane, N-(2-aminoethyl)-3-aminopropylmethyldiethoxysilane, N,N-di(2-aminoethyl)-3-

aminopropylmethyldimethoxysilane, N-[N' (2-aminoethyl)-2-aminoethyl]-3-aminopropylmethyldimethoxysilane, N,N-di(2-aminoethyl)-3-aminopropylmethyldiethoxysilane, and N-[N'-(2-aminoethyl)-2-amino-ethyl]-3-aminopropylmethyldiethoxysilane;

the at least one polyol is at least one member selected from the group consisting of glucose, xylitol, mannitol, sorbitol, resorcinol, pyrogallol, hydroquinone, salicylic acid, and glycerol.

Claims 2-5 (Cancelled).

6. (Previously Presented): The composition as claimed in claim 1, wherein:

composition (A) comprises the further alkoxysilane or alkoxysiloxane, the cocondensate of composition (B) is formed from the further alkoxysilane or alkoxysiloxane, and the reaction product of composition (C) is formed from the further alkoxysilane or alkoxysiloxane ; and

the further alkoxysilane or alkoxysiloxane is at least one member selected from the group consisting of tetraethoxysilane, oligomeric tetraalkoxysilane, propyltrimethoxysilane, propyltriethoxysilane, octyltrimethoxysilane, octyltriethoxysilane, alcoholic and/or aqueous compositions of oligomeric cocondensates composed of aminoalkylalkoxysilanes and of fluoroalkylalkoxysilanes, and oligomeric condensates or cocondensates composed of alkylalkoxysilanes and/or of vinylalkoxysilanes.

7. (Previously Presented): The composition as claimed in claim 1, wherein:

composition (A) comprises the at least one nano- or microscale semimetal oxide or metal oxide, semimetal oxide hydroxide or metal oxide hydroxide, or semimetal hydroxide or metal hydroxide, the cocondensate of composition (B) is formed from the at least one nano- or microscale semimetal oxide or metal oxide, semimetal oxide hydroxide or metal oxide hydroxide, or semimetal hydroxide or metal hydroxide, and the reaction product of composition (C) is formed from the at least one nano- or microscale semimetal oxide or metal oxide, semimetal oxide hydroxide or metal oxide hydroxide, or semimetal hydroxide or metal hydroxide; and

the at least one nano- or microscale semimetal oxide or metal oxide, semimetal oxide hydroxide or metal oxide hydroxide, or semimetal hydroxide or metal hydroxide is at least one member selected from the group consisting of precipitated or fumed silica, silicates, aluminum oxides, aluminum oxide hydroxides, and aluminum hydroxide.

8. (Previously Presented): The composition as claimed in claim 1, wherein the organic solvent is a straight-chain or branched, aliphatic or cycloaliphatic or araliphatic or aromatic alcohol.

9. (Previously Presented): The composition as claimed in claim 1, further comprising a photoinitiator.

10. (Previously Presented): The composition as claimed in claim 1, wherein the composition comprises from 10 to 60% by weight of solids.

11. (Withdrawn): A process for preparing an organosilane-based composition for producing a barrier layer for gases as claimed in claim 1, which comprises:

- a) mixing together components (i), (ii), (iii), where appropriate (iv), where appropriate solvents and water, and permitting the mixture to react at room temperature; or
- b) forming an initial charge from components (i), (ii), and, where appropriate, (iv), heating the mixture, adding component (iii), where appropriate dissolved in a solvent, and adding water, and permitting the mixture to react at reflux; or
- c) forming an initial charge from components (i), (ii), where appropriate (iv), where appropriate solvents, and, where appropriate, component (v), with thorough mixing, heating the mixture, adding component (iii), where appropriate dissolved in a solvent, and adding water, and permitting the mixture to react at reflux; or
- d) dispersing fine-particle silica in vinylsilane, adding the other components, and reacting the mixture at room temperature or at reflux,

wherein there is a molar ratio (i) : (ii) : (iii), wherein (i) = 1 and (ii) = from 0.5 to 1.5 and (iii) = from 0.3 to 1.1.

Claim 12 (Withdrawn): The process as claimed in claim 11, wherein use is made of from 0.5 to 1.8 mol of water per mole of silicon of components (i), (ii), and (iv).

13. (Withdrawn): The process as claimed in claim 11, wherein the amount used of component (v) is from 0.01 to 40% by weight, based on the entirety of components (i) to (iv).

14. (Withdrawn): The process as claimed in claim 11, wherein the reaction is carried out at a temperature in the range from 10 to 90°C and for a period of from 1 to 36 hours.

15. (Withdrawn): A packaging material, comprising:
a plastic, paper, cardboard, or paperboard substrate; and
a barrier layer;
wherein the barrier layer is formed from the composition of claim 1.

16. (Withdrawn): A composite structure, comprising:
a barrier layer; and
at least one further coating applied as an outer layer to the barrier layer;
wherein:
the barrier layer is formed from the composition of claim 1; and
the at least one further coating is capable of curing by a thermal, free-radical, or
radiation method.

17. (Withdrawn): The composite structure as claimed in claim 16, wherein:
the outer layer is formed by applying a coating composition to a cured first barrier
layer and then curing, or by applying a coating composition to an uncured first barrier layer
and then curing;
the coating composition comprises a binder curable by UV radiation or electron beam
radiation; and
the coating composition comprises inorganic lamellar particles.

18. (Withdrawn): The composite structure as claimed in claim 17, wherein the binder
comprises at least one member selected from the group consisting of acrylates, urethane-
derived acrylates, epoxy-derived acrylates, cycloaliphatic epoxides, and polyepoxides.

19. (Withdrawn): The composite structure as claimed in claim 17, wherein the lamellar particles comprise at least one member selected from the group consisting of phyllosilicates and lamellar metal pigments.

20. (Withdrawn): The composite structure as claimed in claim 16, wherein:
the further coating comprises a lacquer;
the lacquer comprises a photoinitiator and at least one reaction product derived from fine pulverulent silicate, organofunctional silane, and water.

21. (Withdrawn): A packaging material composed of plastic, paper, cardboard, or paperboard, which has been coated with a barrier layer composed of a cured composition as claimed in claim 1.

22. (Withdrawn): The packaging material as claimed in claim 21, which has been coated with a further cured outer layer which has been arranged on the barrier layer and has been produced by applying and curing a coating composition which comprises a binder curable by UV radiation or electron beams and comprises inorganic lamellar particles.

23. (Withdrawn): The packaging material as claimed in claim 21, which is sheet-like and takes the form of foils, sheets, or webs.

24. (Withdrawn): The packaging material as claimed in claim 21, which takes the form of three-dimensional hollow articles.